

ANNUAL FRENCH WORKSHOP ON WELL-BEING IN ASTROPHYSICS : MANAGING CONFLICTS, DEVELOPING SOFT SKILLS AND ADVICE ON MOVING TO INDUSTRY

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Abstract. This paper provides a summary of the presentations and discussions held during the 2024 French *Well-being in Astrophysics* workshop held at the French National astronomy meeting. The subjects covered this year were highly diverse and included training provided by two psychologists on managing conflicts, developing soft skills (or transferable skills) that can be useful in both academia as well as other jobs, and advice on how to make a move into industry, provided by three former astrophysics colleagues who now work in other domains.

Keywords: careers, well-being

1 Preventing and Managing Conflicts: Effective Communication and Mutual Respect in the Workplace

In university research laboratories, as well as in many other high-pressure work settings, conflict is an inevitable consequence of the complex interactions between individuals with diverse backgrounds, skillsets, and objectives. Disagreements emerge from the interplay between individuals with disparate skillsets, objectives, and personalities, as well as from the competition for constrained resources. The effective management of these conflicts requires the implementation of transparent and structured communication tools that can facilitate collaboration among team members (De Dreu et al. 2008). In the absence of transparent communication, misunderstandings can rapidly evolve into unresolved tensions. For example, in a university laboratory, an inadequately delineated project, ill-defined roles, or implicit expectations can result in misunderstandings that, if left unaddressed, may evolve into open conflict between colleagues or between supervisors and subordinates.

Conflict is an inherent phenomenon of human nature and organizational dynamics. As stated by Robbins et al. (2013), conflict in organizational settings can occur between individuals, groups, or departments and can result from differences in goals, strategies, or methodologies. This perceived incompatibility gives rise to tension, frustration, and, in some cases, hostile or destructive behavior. However, conflict is not inherently negative; a moderate level of conflict can stimulate change, innovation, and improve the quality of decisions (De Dreu et al. 2003). Furthermore, as Pondy (1967) observed, conflict is intrinsic to competition for limited resources within organizations, as different units vie for access to a larger share of those resources.

To prevent and manage these conflicts, it is essential to consider communication processes. The communication process occurs at three primary levels: verbal, nonverbal, and paraverbal. Verbal communication pertains to the utilization of linguistic elements to convey a message, whereas nonverbal communication encompasses signals such as posture, gestures, and facial expressions. Finally, the paraverbal level encompasses the tone

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of voice, intonation, and rhythm with which words are spoken (Tortoriello et al. 2001). In a work environment such as university laboratories, consistency among these three levels is of paramount importance to avoid misunderstandings. For example, a supervisor who provides clear instructions at the verbal level but uses an aggressive tone of voice or hostile body language may send mixed messages, creating confusion and tension among team members. It is therefore essential to ensure consistency between different levels of communication in order to promote a collaborative and harmonious environment. Even seemingly minor aspects, such as eye contact or physical distance, can significantly influence the perception and response of the interlocutor. Paying attention to these elements can prevent conflict escalation and contribute to more effective communication (Chung 2001).

In the context of international academic collaboration, cultural differences can also serve as a significant source of conflict. Research laboratories, which are often composed of researchers from different nationalities, offer a wide variety of perspectives and ideas. However, this diversity can complicate communication processes. Linguistic, cultural, and gestural differences can generate misunderstandings. Even when two individuals share the same language, their different cultural norms and respective communication styles can lead to misunderstandings and disagreements. For example, behavior that is considered acceptable in one culture may be perceived as inappropriate in another (Chung 2001). It is therefore essential to adopt an open attitude and inquire of the other person whether they feel respected, even in instances where behaviors may appear to be self-evident. Cultural differences, gender, and ethnicity can also fuel unconscious biases. These biases, rooted in the context in which individuals were raised and in their personal experiences, influence workplace interactions, often without their awareness. Despite being unintentional, this form of discrimination can generate frustration and resentment within the team, exacerbating pre-existing tensions and compromising both productivity and overall well-being (Maslach et al. 2016).

It is therefore crucial to understand the strategies required to establish personal and professional relationships effectively and the tools to facilitate optimal communication. Among these, we introduce active listening and assertiveness. Active listening requires the listener to stop judgement in order to focus fully on the message being conveyed by the other party. This approach, which requires attentive and conscious participation, makes it possible to capture not only the words but also the emotions and intentions of the message, thus facilitating an open and constructive dialog. In this way, defensive barriers are reduced and a climate of trust is created, which facilitates the management of conflict in a calm and rational manner (Goleman 1995). Assertiveness, on the other hand, involves expressing one's needs, opinions, and feelings clearly and directly, without resorting to aggression or passivity. This approach is particularly effective in collaborative environments, such as academic settings, where clarity of expectations and feedback is critical to preventing misunderstandings and maintaining a respectful and productive work environment (Tortoriello et al. 2001).

In this regard, it is critical to understand the dynamics that can raise communication barriers and thus fuel conflict. Elements such as control, devaluation, manipulation, and a sense of superiority are behaviors that inhibit open and constructive communication. Control occurs when one person tries to dominate the conversation or decisions, reducing the opportunity for the other party to express his or her opinion. Devaluation occurs when people minimize or ignore the views of others, creating frustration and resentment. Manipulation involves the use of techniques to deceptively influence the other party, while an attitude of superiority can make the other party feel disrespected or inferior, increasing tension.

To avoid these dynamics and reduce the level of conflict, it is important to adopt behaviors that facilitate open and transparent communication. These practices include using objective descriptions rather than judgement, focusing on issues rather than people, maintaining an open-minded attitude, and fostering a climate of equality in which all opinions are considered legitimate. These approaches make it possible to break down defensive barriers and facilitate a more peaceful and productive dialogue. From a conflict management perspective, Thomas & Kilman (1974) propose the win-win negotiation strategy. This approach seeks a win-win solution for both parties and prevents the conflict from degenerating into a struggle for dominance. In order for win-win negotiation to work, it is necessary to have certain key skills, such as the ability to actively listen, the assertiveness to clearly express one's needs, and mutual trust. In addition, a willingness to engage in an open and collaborative dialogue that fosters the achievement of a shared solution is essential.

Solving conflict is difficult and must be done in several steps. First, it is necessary to acknowledge that a problem exists, often by analyzing the negative emotions that arise. The next step is to identify the problem by understanding exactly where, when, and with whom it occurred, and what actions contributed to the situation. Once the goal to be achieved is clear, different solutions, including creative ones, can be explored without immediate judgement. After considering the consequences of each solution, choose the most appropriate one

and plan a detailed path to implement it. Finally, verify that the solution has actually solved the problem, evaluate the results, and adjust the plan if necessary. A collaborative approach to conflict resolution, as suggested by Johnson et al. (2000), not only allows differences to be resolved effectively, but also promotes the building of stronger relationships and an overall improvement in the organizational climate.

2 What are soft skills and why should we care?

Skills generally refer to sets of competencies required for employment and for being successful (either for a specific job or possibly different jobs). *Hard skills* are job-specific and reflect the *expertise* of an employee in a given job context, while *soft skills* compose a set of *non-technical skills* gained through experience working in a collaborative environment (e.g., autonomy, initiative, teamwork...). Soft skills are not personality traits per se (e.g., being curious, patient, driven, calm, modest, spontaneous, enthusiastic, passionate, ...) but rather attributes that define how people interact with each other and with the environment, in order to reach personal and common goals. Many alternative terms are used to define soft skills that illustrate not only their diversity but also and most importantly their relationship with social links and their relevance in widely different professional contexts. Among all these terms, the most informative and useful ones would be *transferable skills* and *interpersonal skills* in English, and *compétences socio-professionnelles* and *compétences polyfonctionnelles* in French. We use *soft skills* in the following as an umbrella term.

Here we examine the results of a recent survey by researchers in psychology, business, and sociology, which led to the report *Les Soft Skills liées à l'innovation et à la transformation des organisations. Du Roscoët, Servajean-Hilst & Bauvet 2022, Institut de la Transformation et de l'Innovation (ITI)*. This report is quite important as it is one of the very few rigorous studies on soft skills, especially in France where soft skills are not a focus of the education system and where the frequently used terms *savoir* (knowledge), *savoir-faire* (know how), *faire-faire* (make-do) do not usually reflect the core skills. Secondly, this report palliates the elusive information found online that often simply constitutes a mixed bag of arbitrary definitions sometimes related to purely personal development (when collaborative aspects should be central). Finally, the above report identifies soft skills as a crucial set of skills required to *innovate*, and, as such, it is highly relevant to the field of research, which progresses through successive breakthroughs in a collaborative environment.

It must also be emphasized that artificial intelligence (AI) and *working from home* have completely redefined the work environment and the relationships between collaborators. Interestingly, however, AI ultimately shifts the important sets of skills toward soft skills, while remote work requires many soft skills in order to be efficient as a team. All in all, it is no surprise that soft skills have gained much attention recently, from small to big companies (2023 was the European year of skills with a specific focus on *transversal skills*). In parallel, PhD diplomas are becoming more widely recognized by both public and private companies, not necessarily for the expertise in a given topic but rather for the wide palette of skills acquired that may be applied to a completely different context.

2.1 The ITI study on soft skills

Through a field study with many innovators in French companies, the ITI study provides a useful common reference grid of defined skills, a framework to evaluate their impact on performance, and recommendations at various levels (education, the hiring process, training, ...). The main result shows that 65% of important skills for innovation are soft skills, 23% are personality traits, while only 12% are job/business (hard) skills, implying that soft skills represent a *large reservoir of important, distinct, skills*, while hard skills represent a smaller – but essential! – skillset.

The ITI study identifies four families of skills (cognitive, conative, emotional, environmental), all connected to an additional 5th one (relational). **Cognitive** skills are well known to researchers as they deal with the ability to process and treat the surrounding information (e.g., problem solving, deduction, mental flexibility, ...). Within cognitive skills, the report highlights the *breathing rhythm of creativity*, alternating between divergent (e.g., creativity) and convergent thinking (e.g. a holistic view). **Conative** skills define the ability to act (e.g., intuitive thinking, measured risk taking, intellectual curiosity, dealing with ambiguity, social abilities, ...). Within conative skills, the report highlights the difference between motivation (which fluctuates) and perseverance (keep doing things in a constant, reliable, way). **Emotional intelligence** skills often build upon personal traits and include cognitive empathy (understanding other people's point of view) as well as affect empathy (recognizing our own, as well as others' emotions). **Environmental** skills include perspicacity and understanding the context (e.g., coordination for team/hierarchy to achieve objectives, cohesion between

teams, autonomy and initiative, understanding the culture of the institution, ...). The central **relational** skills include individual skills that irrigate and connect the four others: for instance, creativity is useful only through a collective effort. Relational skills make collaboration (e.g. through leadership) and communication (e.g. through persuasion) possible.

These categories led the ITI study to the following comprehensive definition of soft skills: *soft skills are a dynamic and connected ensemble of skills geared towards the development of the individual and collective ability of people to situate themselves, to interact, and to shape an environment with the goal of innovating in mind.* Soft skills are not an innate or immutable set of skills: they are acquired and improved through experience and training through life and work. Self-reflection is essential to identify strong/weak soft skills, which can be done either through reflexivity (i.e., purely personal reflection) and/or through other people's points of view. Soft skills can be generally improved through extra-curricular/after-work social activities, but some training workshops and courses do focus on soft skills by favoring collective decisions and developing a thriving environment where better answers may emerge. Perhaps the best and most universal way to improve soft skills is by learning a language (e.g. gaining confidence through immersion, improving sensitivity to other cultures, communication, ...).

2.2 Soft skills in research

The ITI study is relevant to the field of research since the latter always proceeds through innovation (the term itself implying that novel ideas eventually lead to a concrete result, an implementation) and since an innovator is always a co-innovator. First and foremost, soft skills represent an essential part of the PhD experience, which the PhD diploma validates. These include perseverance (long and hard journey filled with uncertainties and possibly valuable failures), the ability to collect and digest information (literature review, consensus, ...), communication (written and oral, persuasion, ...), collaboration (team work, proposing ideas, ...), and, of course, problem solving. The ability to situate and immerse oneself within a collaborative environment where initiative is encouraged is useful to build self-confidence and to build a personal skillset that will be carried through life.

Through a PhD or a career in research, soft skills can be improved by asking oneself and others the right questions: What are we trying to accomplish? Why, and who will benefit from it? How can the field progress, e.g. through what kind of collaboration? and are the envisioned risks worthwhile for the project, team, and institution? Other useful ways to improve soft skills would be to systematically confront ideas, compare approaches, or collaborate with competitors. Finally, emotional skills develop naturally by putting oneself in the shoes of collaborators, of the person receiving feedback, of the reader, of the audience, and of the employee/employer.

As a stable ecosystem of skills that is relevant to different contexts, it is expected that soft skills are more easily transferable compared to hard skills, but translating/transposing skills in general (soft or hard) inevitably requires 1) to identify and evaluate them, 2) to convince others that they have been impactful.

- Transitioning within academia is relatively simple. Whilst the areas of expertise may be different, hard skills remain at least somewhat relevant. Depending on the exact field, the focus is indeed usually set on hard skills, implying that CVs and interviews require only minor adaptations. Conveying soft skills in academia should be done with caution as it supposes a common reference and recognition. In fact, soft skills may not have to be explicitly described as they naturally emerge – and are validated – from the general work output (papers, talks, networks, ...), leading to some qualitative indicators (e.g. collaborations, leadership of projects, ...).
- Transitioning from academia to the non-academic world can be more difficult (see also Section 2.2), as hard skills may lack direct application. Soft skills, however, may play a more important role. Nevertheless, even though soft skills remain more or less the same across different fields or workplaces, they do need to be re-articulated much like hard skills, using illustrations and examples showcasing how they have been useful and how they are envisioned to remain useful in the new workplace. In other words, simply stating that one has, e.g. autonomy, means little by itself unless it is inscribed within a given situation or scenario.

3 The transition from research to industry

Whatever the motivation to leave academia, be it a search for job security in a chosen place, without the need to move countries every couple of years, or to try something new, or to earn more money, or to have a

change of career path, it is crucial to anticipate and prepare for this (major) professional change. There are a number of jobs that exist that are closely related to astrophysics and with a number of opportunities to continue some research activities, where others are only tenuously related. Here we provide feedback and advice on transitioning to industry from research, from three colleagues that have all completed a PhD in astrophysics and two that also experienced several years of post-doctoral experience, before making the transition to industry.

3.1 *Differences between research and industry*

The world of business is different from the world of research, especially in terms of the skills required (see also Section 2.2). In research, the spirit is one of conquest and discovery, with a constant need to understand. The industrial world needs more immediate results. It can be difficult to convince people that the cross-disciplinary skills and curiosity developed in research can be an asset to a company that needs people who can operate according to standard protocols, but see also Section 2.2.

To do so implies a change of mindset to understand the expectations of the job market. This includes understanding the job, how to write a resume that will catch the attention of headhunters and how to succeed in the hiring process.

The process starts with understanding that there is a difference in the definition of skills between research and non-research job markets, see also Section 2.2. In academia, knowledge of a specific research field is highlighted by a publication list and your contributions. The impact of your research is also measured by a list of oral contributions. Outside of academia, the paradigm is completely different. Core skills are what can be concretely done: knowledge and experience in a given programming language, tools that are mastered, experience in project or team management, etc. The context surrounding those skills and experience can be a bonus in the hiring process if they match with the job description. Those differences lead to different expectations regarding the content of a good resume. Outside of academia, a resume longer than one page is likely to be discarded. It is mandatory to transform the wording to wash out the research vocabulary, see also Section 2.2. For instance, being the principal investigator of an observing proposal involving several researchers and that led to multiple publications is not understandable by most employers. On the other hand, managing a project from its definition (the proposal) to its delivery (the publications) is understood as a project management experience. Adding key words to the resume is also good practice as most headhunters do not understand the underlying skills and search for matching keywords. Adapting to this different language is probably the greatest challenge when leaving academia. The second biggest one is to explain that your research experience is relevant to the job that you are applying for. This requires pedagogy and should be prepared well in advance of a job application/interview.

3.2 *Skills acquired in academia that are essential in industry*

Whilst your PhD subject maybe quite unrelated to the job application, the skillset that you acquired during your PhD is highly valuable. This skillset includes speaking and writing in English, writing documents, analysing data, troubleshooting code, problem solving, coding, collaboration, leadership, initiative, mental agility and adaptability, communication skills, curiosity, numeracy, autonomy, note taking, etc. Another skill that may be acquired during a period in academia is how to deal with stressful situations, but see also the soft skills discussed in Section 2.2.

3.3 *Lessons learnt*

The context and goals are different between academia and *the outside world*. Project life cycles and stakes are different. The pay is generally higher in industry, but working on interesting topics in science or doing research-like work is nonetheless possible as a part of these jobs. If you have the desire to continue to learn exciting things, you can still find many opportunities to do so in industry.

It can be difficult to get an employer to recognise the years spent in academia as relevant experience to allow you to start your industry job on a higher pay scale, but it can be possible and is worth pursuing. A change of job can also help you put your experiences into perspective and help you have a healthier relationship with your work.

4 Conclusions

4.1 Managing conflicts

Conflicts occur in all walks of life and are not specific to the workplace or academia. However, we provide here several structures that can provide support to those in academia. Firstly, your institute should be able to provide some support. Policies such as the 'rules and regulations' of your institute should stipulate examples of types of behaviours that are and are not allowed. They should put into place control measures to prevent violence in the workplace as well as outlining the measures and procedures for dealing with violent incidents, both at the time of the incident and after the incident. They should also stipulate the consequences for breaching the policy and the duties of all employees (regardless of seniority), including managers and supervisors. Other information that should be provided includes how employees can report a concern or an incident and encourage employees to report incidents, no matter how minor. This information should also include the process the organisation will undertake when receiving a report or dealing with a concern, and information about support services available and referral information for all people involved.

If reporting an incident(s) is not possible, an option in France is to contact the 'Equality officer' who can offer advice on how to deal with the incident(s). Alternatively, for a conflict in a French institute, you can contact the CNRS mediator, who as an independent observer can help mediate a conflict. The mediator can be contacted via email : la-mediatrice@cnrs.fr and see also the webpage <https://www.cnrs.fr/fr/actualite/la-mediation-une-demarche-pour-depasser-les-conflits>. Another alternative is to contact *France Victime*, for which there is a special contact for French researchers through the CNRS, even if you are not employed by the CNRS. The telephone line +33(0)180523377 is open from 09:00 to 21:00 local time, everyday (including weekends), or via the email address cnrs@france-victimes.fr . This contact can be made anonymously.

4.2 Soft skills and moving to industry

Soft skills represent a stable ecosystem of skills that can be transferred to other job contexts. They build upon personality traits, reflexivity, and training. Soft skills partly enable, improve, value and give meaning to hard skills, which are job-specific. Proficiency in soft and hard skills is necessary in order to produce a successful workplace where rewarding breakthroughs are possible. The field of research in general allows you to acquire, improve and validate soft skills, which become important skills within academia but may also be translated to completely different contexts, including work in industry.

Making the move to industry requires initial investment to successfully sell the skillset that has been acquired during the period spent in academia, but the feedback from colleagues that have already made the transition was extremely positive, with both worlds providing fulfilling and interesting jobs.

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